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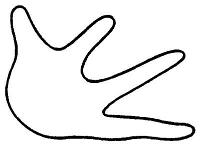
Williamstown, Pa. The specimen is a mass of coal shale, with foot prints, and was discovered by the donor at the Ellangowan Colliery, in strata between the Primrose and Mammoth veins, in the Mahanoy coal field. Mr. Lorenz remarks that it is of especial interest, as the first specimen of the kind found in the Anthracite coal field. The *Sauropus primævus* of Lea, of which the original specimen is preserved in our museum, was discovered in the umbral red shale, near Pottsville, belonging to the subcarboniferous series.

The specimen before us is an irregular slab, upwards of a foot long and less than half the breadth. The upper surface is obscurely ripple marked longitudinally, and is crossed in a slant by seven tracks, which are in pairs, except one in advance on the right. Three only are complete, the others being imperfect. The four tracks on the right occupy a line of six inches, and are about an inch and a half apart from those on the left. The tracks appear to be single, that is to say, not produced by fore and hind feet together, and no distinction can be detected between impressions of these. The more perfect impressions exhibit four widely divergent toes, successively increasing in length from within outwardly, excepting that the fourth toe is slightly shorter than the third. A feeble rounded impression of a sole is visible behind the toes. The expanse of the tracks is about an inch. The accompanying outline will give an idea of their form, though the sole comparatively with the toes is not so distinctly defined. The intervals of the toes appear not to be webbed, or at most are only feebly so.



The impressions are probably those of an amphibian, and perhaps pertained to some salamandroid animal.

As it is customary to refer to fossil foot tracks, as representing the animals by which they were made, under distinct names, it would be proper to designate the present specimen in the same way. In accordance with its discovery in the Anthracite coal field, and from the colliery in which the specimen was found, Mr. Lorenz suggests that it should be called the ANTHRACOPUS ELLANGOWENSIS.

On Sex in Castanea Americana.—Mr. THOMAS MEEHAN referred to the flowers of the common chestnut, *Castanea Americana*, and pointed out that the flowers were the products of axillary buds, which, in young trees, would have borne branches. These spikes of male flowers fell off by an articulation in the axils of the leaves soon after the flowers were mature, and it was remarkable that in young trees that had not arrived at bearing condition, the buds also fell by an articulation before developing the axillary branchlet. Sometimes the leaves would be considerably advanced before the disarticulation occurred. Chestnut branches several years old would be found full of these scars where the buds had been; but never would be found a perfect dormant bud, except at the termination of a branch, after the branch was one year old. There seemed to be whole classes of trees with distinct peculiarities in this respect. Leguminosæ would preserve dormant buds for an indefinite number of years. In *Gymnocladus*, the Kentucky coffee tree, the axillary bud of the one year branch could be found twenty years afterwards just beneath the bark, in the position it first occupied, having in all that time grown just enough as the tree grew to keep just beneath the surface. The same is true of magnolias. In some, young branchlets came from the axillary buds the spring following their formation, and continued an existence as weak branchlets for a few years until starved out by the stronger ones, but when they reached a flowering condition the whole axillary bud died out with the effort of producing flowers. This was well illustrated by some maples. There was a third class which produced flowers and also an axillary bud, and these continued always through life twiggy branching trees, depending also on ultimate starvation of the branchlets to keep the supply of main branches within bounds. Birches are good examples of this class. The chestnut seems to be the only tree which takes the matter in hand in time, and keeps down a superabundance of branchlets by a disarticulation of the buds themselves, though in arbor vitæs, deciduous cypress, and some others, there is a disarticulation of superabundant branches after they are a year or so old, in this way keeping finally but a few main branches to preserve the form and permit of the functions of the head of the tree.

In the growing branch of the flowering chestnut tree the first four or five axillary buds, instead of a branch or futile buds for next spring, produce at once spikes of male flowers. Often the two upper axillary buds remain till next spring, to run the chance of being thrown off as a bud, or perchance to make a weak branchlet. After these buds have been formed, a subsidiary second growth is formed, and from this renewed growth another crop of male flowers, at the base of which, if at all, two or three clusters of female flowers appear. The first crop of wholly male flowers disappears without apparently being of any service whatever in reproduction. It is an enormous waste of energy if the fertilization of flowers be the sole end of production. In each spike there were about fifty clusters, and at least five flowers in each cluster, and there were about five of these precocious spikes to each branch that might in the end bear two or three female flowers, or, in round numbers, over one thousand male flowers to one female, and when we remember that half the branches produce only the precocious male flowers, there would be two thousand males to one female, even under the best circumstances; but, as already noted, the whole mass of flowers which give so much charm to a chestnut tree fall off without any influence whatever on the fruit production of any trees in the vicinity, as the female flowers are not in bloom till these showy early ones have fallen, and depend on the second crop of male flowers for fertilization.

For what purpose is this immense mass of bloom with its resultant pollen created? Mr. Meehan believed that modern teleology based on the selfish idea that acts of each individual are solely for its own good, or the good of its immediate descendants, was wrong. The animal world, in the shape of insects perhaps, or in any other way, could be no more said to be created for the vegetable, as fertilizers of flowers, than were plants for them. It is a popular saying, that mouths were not created before something was prepared to put into them; and scientifically this might be reduced to the proposition, that plants may be made to behave and to produce, for ends having no relation whatever to their own individual wants, but that all things might be made to work together in harmony for some universal good.

Mr. Redfield asked whether it might not be that chestnut woods in more southern latitudes, and with female flowers more advanced, could receive the pollen from the precocious flowers of these northern trees; and, in view of the accidents liable to such a distant transmission by the winds, nature provided this immense superabundance to make the cross-fertilization more certain?

Mr. Meehan replied that he could not say; but if an answer to his questions were to be met by any of the prevailing theories on the necessities or utilities of cross-fertilization, he would like to ask what was the use of odor in the event of Mr. Redfield's question being answered affirmatively? The male flowers of the sweet chestnut were remarkably odoriferous. A fair sized bunch in a room would give fragrance to a whole house. Where would be the use of adding this powerful odor to flowers in mere arrangements for cross-fertilization by the aid of winds?

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